The "uniform energy distribution," which is described in Yamamoto et al. and which is pointed out in the Office Action (page 2, cipher 3, lines 6-7), is a measurement of precision but is not a measurement of accuracy. Likewise, the "fluctuations of the energy beam to about 2 to 3 percent," which is described in Mori et al. and which is pointed out in the Office Action (page 3, lines 1-2), is a measurement of precision but is not a measurement of accuracy. In Applicants' invention, "± 11.2%" is an accuracy measurement but is not a precision measurement.

The Examiner's rejection of claims 1 and 17-22 under 35 USC § 103(a) as unpatentable over Suzuki (Japanese Patent 06-267,826) in view of Chae (U.S. Patent No. 5,432,122) is improper because Suzuki teaches a precision of 1%, not an accuracy of 1%.

In Suzuki, the 1% is the precision of the measurement (paragraph [0045]). That is, the closeness of the grouping of the measurement. Applicants' invention requires an accuracy of ± 11.2%, not a precision of ± 11.2%.

The range of ± 11.2% defined in the present Application represents the spatial distribution of the intensity of the light beam upon single pulse irradiation. On the other hand, in Suzuki, the distribution curve has a trapezoidal profile in Fig. 4 (corresponding to Fig. 2(a) in Mori) with a flat portion. Thus, Suzuki does not consider that the intensity of the light beam has spatial distribution. In Suzuki, the light beam having such a trapezoidal profile is irradiated (scanned over a wide area as compared with the beam). The estimation of 1% in Suzuki refers to the absolute value (at a particular point) of the total energy and the uniformity of the spatial distribution (superimposed beam energy) after irradiation by a plurality of pulses. This is effective in a system, such as a resist, in which the reaction is controlled by the total amount of irradiated luminous energy.

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However, in crystallization in the present Application, the reaction is controlled by the energy of the single pulse. Therefore, it is important to achieve uniform energy distribution in the single pulse. In other words, in Suzuki, the same effect is achieved in the case of 100 + 100 + 100 = 300 mJ (three pulses) and in the case of 50 + 50 + 50 + 50 + 50 + 50 = 300 mJ (six pulses). On the other hand, in the present Application, the single pulse must have the intensity of 400 mJ ± 11.2%. Even if 100 + 100 + 100 + 100 = 400 mJ is achieved by four pulses, crystallization does not take place because the single pulse has no more than the intensity of 100 mJ. Therefore, the same effect cannot be achieved by Suzuki. The secondary reference Chae also does not teach an accuracy of ±11.2%. Therefore, no combination of Suzuki and Chae could achieve or render obvious independent claims 1 and 22, both of which require an accuracy of ± 11.2%.

The rejection of claims 19-21 under 35 USC §103(a) as being unpatentable over Yamamoto et al. in view of Mori et al. and in further view of Suzuki is improper for the reason stated above. Claims 19-21 depend on independent claim 1. Neither Yamamoto et al., Mori et al. nor Suzuki teaches a measurement of accuracy of ± 11.2%., as required by independent claim 1. Therefore, this rejection is in error.

Claims 17-21 depend directly or indirectly on claim 1 and are allowable for the same reasons as stated above, as well as for their own additional limitations. Thus, no combination of Yamamoto et al. and Mori et al., Yamamoto et al., Mori et al. and Suzuki, or Suzuki and Chae could achieve or render obvious dependent claims 17-21.

Having dealt with all the objections raised by the Examiner, it is believed the Application now is in order for allowance.

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Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on August 5, 2003, at Tucson, Arizona.

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